

REMARKS

Claim 9 has been rejected by the Examiner under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. As the Examiner will note, claim 9 has been amended as suggested by the Examiner and accordingly it is believed that this rejection has been eliminated.

Claims 1 and 9 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Ichida (EP 1,072,446) in view of Marzocchi 059 (U.S. 3,364,059) and Marzocchi 280 (3,620,280). This rejection is respectfully traversed.

The present invention is directed to a studless tire which has superior performance on ice and snow and wherein the adhesion friction, digging friction and scratching friction of the tire to the road and the abrasion resistance are improved and maintained. The studless tire of the present invention employs the unique combination of (1) non-metal short fibers, for example, short glass fibers, which have been surfaced treated with a treating agent comprising sulfur-containing mercaptosilane and (2) incorporating the fibers into the tires such that the fibers are substantially oriented in the tread thickness direction. The improved braking properties and abrasion resisting properties of the present invention can be seen by referring to Examples 1 and 2 in Table 1 on pages 12-14 of the present application.

The Uchida '446 reference discloses a studless tire that is excellent, especially in performance on snow or ice covered roads, wherein non-metal staple fibers having a average fiber diameter of 1 to 100 μm and an average length of 0.1 to 5 mm are dispersed in a diene rubber in such a way that the non-metal staple fibers are oriented in a thickness direction of the tire tread. The tire tread of the Uchida reference generally discloses the complex elastic modulus ratio range and tread rubber hardness properties as defined by the present invention but fails to disclose or suggest the use of a surfacing treating agent for anchoring the short glass fibers to the rubber material. In fact, the European reference appears to achieve the desired anchoring by controlling the diameter of the fibers as well as the length of the fibers. Thus, the European

reference is not looking to solve the problem of causing the glass fibers to adhere the rubber material. The Examiner, recognizing that the Uchida patent does not suggest the use of a composition for anchoring the glass fibers to the rubber material has further relied upon the Marzocchi '059 and the Marzocchi '280 patents in an attempt to fill this deficiency.

The Marzocchi '059 patent does, in fact, show glass fibers which are treated to improve their bonding relationship with synthetic and organic rubbers. However, the Marzocchi reference does not even remotely suggest the use of glass fibers in a studless tire but rather only generally refers to the use of glass fibers in elastomeric systems fabricated into molded and laminated products, coating fabrics, and the like. Accordingly, since the reference patent is not concerned with the use of glass fibers in studless tires, the patentee cannot possibly suggest or contemplate that the glass fibers should be oriented in the tire thickness direction. Furthermore, since the Marzocchi '059 reference is not concerned with vehicle tires, there obviously is no contemplation of the advantageous tire performance achieved by the present invention, that is, improved abrasion resistance, braking properties, and the superior performance of the tires on ice and snow due to adhesion friction, digging friction and scratching friction of the tire to the road. Accordingly, since the European reference is not looking to solve the problem of separation of the glass fibers from the rubber materials and since the Marzocchi '059 patent does not suggest that the fibers disclosed therein can be used in connection with tire treads and solving specific problems associated with tire treads, it is the Applicants' position that it would not be obvious to combine the teachings of these respective references without making use of the Applicants' own disclosure.

The Marzocchi '280 patent has been relied upon by the Examiner to show pneumatic tires having a tread comprising rubber and chopped structures 83 (see Fig. 5). The chopped structures 83 are made from a yarn comprising glass filament wrapped about an organic core. Thus the Marzocchi '280 reference is primarily directed to a reinforcement system which can be used in tires which employ glass and other reinforcement materials which are twisted together to form a composite cord which takes advantage of the individual properties of the glass and organic

filaments to achieve the desired reinforcement properties desired in the reference patent. In the present invention, the glass fibers are not wrapped around an organic core but rather are dispersed in the diene rubber so as to be oriented in the tread thickness direction. The orientation of the chopped structures 83 in Fig. 5 and further referred to in lines 5-10 of Col. 5 of the Marzocchi '280 patent clearly show a tire construction wherein the plurality of short lengths of composite cord structure 50 are provided in the tread region in a random orientation as distinguished from an orientation in the thread thickness direction as defined by the present invention. Furthermore, the Marzocchi '280 reference does not appear to be even remotely concerned with providing a vehicle tire with improved braking and adhesion resistance properties as well as an enhanced performance on ice or snow.

Thus, the claims of the present application define an invention in which a number of parameters are brought together in a unique combination to provide a studless tire which has superior performance on ice and snow and in which the adhesion friction, digging friction, and scratching friction of the tire to the road and the abrasion resistance of the tire are improved and maintained. Table 1 of the present application shows the importance of all of the many features of the present invention in achieving the Applicants' inventive contribution and Table 1 demonstrates that the absence of one or more of the features of the present invention leads to an inferior result. Thus, Comparative Example 1 which does not contain short fibers shows inferior results. Comparative Example 2 which does not contain a surface treatment of the fibers proves to be inadequate. In Comparative Example 3, the glass fiber orientation was improper and in Comparative Examples 4 and 5, the elastic modulus and the tread hardness were not achieved. Thus, claims 1, 2 and 9 are directed to a studless tire which contains specific components and specific properties for solving specific problems. The Examiner, in attempting to reject the claims of the present application, must rely upon three different references and dissect bits and pieces from each of the references and combine the references with no basis for combination. Accordingly, it is necessary for the Examiner to reconstruct the teachings of the references in view of the Applicants' own disclosure.

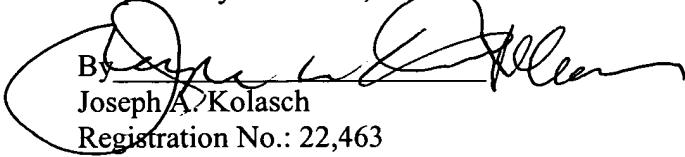
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Accordingly, in view of the above amendments and remarks, reconsideration of the rejection and allowance of the claims of the present application are respectfully requested.

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Respectfully submitted,

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